Through civil war, food crisis and drought: trends in fertility and nuptiality in Post-Soviet Tajikistan

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Through Civil War, Food Crisis and Drought: Trends in Fertility and Nuptiality in Post-Soviet Tajikistan

Au Travers de la Guerre Civile, de la Crise Alimentaire et de la Sécheresse : les Évolutions de la Fécondité et de la Nuptialité en Tadjikistan Post-Soviétique

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Abstract This article has two objectives. First, it aims to complement and extend existing research on post-socialist demographic change, which has thus far tended to focus on Central and Eastern Europe. It does this by describing the nature of post-Soviet trends in nuptiality and fertility in Tajikistan, the republic with the highest rate of population growth during the Soviet period. It finds evidence for a decrease in period fertility after independence: initially, through a decline at higher orders; then, through a significant decrease in the rate of first births, associated with a dramatic decrease in the rate of first union formation since the mid-1990s. Second, it aims to contribute to the demography of conflict and of food crisis. Most clearly, it finds strong evidence for a decrease in nuptiality and fertility associated with the 1995 food crisis.

Keywords Post-Soviet · Central Asia · Tajikistan · Fertility · Union formation · Civil war · Food crisis

Résumé Cet article a deux objectifs. Premièrement, il contribue à enrichir et élargir les recherches relatives aux changements démographiques observés au cours de la période post-socialiste, focalisées jusqu'à présent sur l'Europe Centrale et Orientale, en décrivant les caractéristiques des évolutions post-soviétiques de la nuptialité et de la fécondité au Tadjikistan, République ayant eu le taux de croissance de la population le plus élevé au cours de la période soviétique. Après l'indépendance, le déclin de la fécondité transversale a d'abord débuté par une baisse des naissances de rangs élevés, puis a continué avec une baisse du taux des naissances de premier rang associée à une chute dramatique du taux de formation de la première union depuis le

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milieu des années 1990. Deuxièmement, cet article apporte une contribution à la démographie des conflits et des crises alimentaires. Plus précisément, il montre clairement une association entre le déclin de la nuptialité et de la fécondité et la crise alimentaire de 1995.

Mots-clés Post-soviétique · Asie Centrale · Tadjikistan · Fécondité · Formation des unions · Guerre civile · Crise alimentaire

1 Introduction

The collapse of socialism in Eastern Europe and the former Soviet Union offers 'potentially rich material for an examination of the effects of dramatic sociopolitical and economic change on marital and fertility behaviour' (Agadjanian 1999, p. 426). There are a number of studies examining recent marital and fertility changes in Central and Eastern Europe (for example, Conrad et al. 1996; Kučera et al. 2000; Macura 2000; Kohler and Kohler 2002; Sobotka 2002; Philipov and Dorbritz 2003; Sobotka 2004; Perelli-Harris 2005; Kotowska et al. 2008; Sobotka et al. 2008; Zakharov 2008; Thornton and Philipov 2009). However, the post-Soviet republics of Central Asia have been relatively neglected in the demographic literature (Gentile 2005). This article seeks to address this research need by analysing marriage and fertility change in post-Soviet Tajikistan.

Tajikistan, after Uzbekistan and Kazakhstan the third most populous state in Central Asia, had a total de jure permanent population of 6.1 million according to the 2000 census, 74% living in rural areas (Rowland 2005). In terms of the study of post-Soviet fertility change, Tajikistan is of particular interest. First, traditionally it had the highest fertility of the Soviet republics. Census data show that Tajikistan had the highest average annual rates of population growth in the Soviet Union in each of the periods 1959–1970, 1970–79, and 1979–1989 (Anderson and Silver 1989). Studies in Eastern Europe have documented the effect of post-socialist and post-Soviet change, and the effect of dramatic social and economic crisis, in a context where fertility was already at or approaching replacement level. The effect on 'pre-transitional' populations like Tajikistan (Anichkin and Vishnevskii 1992:61) is less well documented. Therefore, the first objective of the article is to, by describing the nature of trends in fertility and nuptiality in Tajikistan, contribute to our understanding of post-socialist demographic change in the Central Asian context. Second, of all the ex-socialist and ex-Soviet states, Tajikistan has experienced the most acute social and economic problems since independence. In particular, Tajikistan's population has been subject to three specific shocks: a civil war between 1992 and 1997; a food crisis in 1995; and a drought in 2000–2001, which also led to food shortages. Therefore, the second objective of the article is to contribute to the literature on the demography of conflict and of food crises.

The article begins by examining existing evidence for fertility decline in post-socialist Europe and Central Asia, and for the impact of food crisis and civil war on fertility. The following section describes the nature of social and economic changes,

and of particular crisis periods, in post-Soviet Tajikistan. A description of fertility change in Tajikistan from the late 1950s helps to provide historical context for the more recent changes. The 'Data and Method' section then explains the preference for the use of survey data over vital registration data—and describes the models subsequently used to examine trends in fertility and nuptiality in post-Soviet Tajikistan.

1.1 Post-Socialist Fertility Decline in Europe and Central Asia

Post-socialist fertility decline in Europe has been substantial. Ex-socialist Europe became the lowest fertility region in the world after the dramatic decline in period fertility during the 1990s, with total fertility in most countries ranging between 1.1 and 1.4 at the turn of the millennium (Sobotka 2002). The replacement of the state socialist regimes by the economic and political infrastructures of contemporary capitalism is regarded as the 'root cause' of the decline (Frejka 2008). Three strands of associated changes are regarded as important: ideational and cultural changes regarding family formation behaviour; economic change associated with the development of the market economy, which undermined the basis of universal and early family formation, and periods of particular economic crisis which also constrained family formation.

The importance of these factors has been different in different countries. Declines in countries of Central Europe, which experienced a relatively successful post-socialist economic transition, have been attributed more to ideational change and the 'Westernisation' of fertility behaviour, and to the opportunities and risks presented by the transition to market economy, including competition in the labour market and job insecurity. Here, the decline in fertility has been characterised by the postponement of first births. In contrast, declines in southeastern Europe and ex-Soviet European states, which have experienced the most difficult post-socialist transition,[1] have been attributed more to the depth of social and economic crisis in these countries (Macura 2000; Philipov and Dorbritz 2003; Sobotka 2004). Shrinkage in national economies, together with the removal of the three pillars of the former socialist system—guaranteed employment, subsidised and stable pricing, and social benefits and services (Standing 1996:230)—combined to bring dramatic declines in living standards. In Belarus, for example, 'the slowing of the economy, skyrocketing inflation, destabilisation of the production sphere, increasing unemployment… impoverishment of the population' and associated uncertainties generated by the crisis 'undoubtedly' affected fertility (Shakhotska 2000:36). Unlike in Central Europe, in the first half of the 1990s first-order birth rates in ex-Soviet and southeastern Europe were robust, and total fertility decline was driven by reductions in second and higher birth orders (see, for example, Steshenko 2000; Perelli-Harris 2005 for Ukraine; Bulgaru et al. 2000 for Moldova; Kohler and Kohler 2002 for Russia; Stankuniene 2000 for Lithuania; Katus et al. 2000 for Estonia; Aassve et al. 2006 for Albania), though increases in the mean age at first

[1] However, note that the Baltic republics of Estonia, Latvia and Lithuania experienced less severe and prolonged decreases in GDP per capita than, for example, Moldova and Ukraine.

birth in these countries since the mid-1990s are indicative of a decline in period first order rates (see TransMONEE 2006).

Central Asia is culturally, historically and demographically very different from post-Soviet Europe. Nevertheless, both regions have emerged from what Sobotka (2002, p. 42) has termed the 'socialist greenhouse'—an environment which had served to encourage childbearing, or at least undermine reasons to reduce it. Further, during this transition countries in both regions have faced severe economic crises. But while a number of academic studies have documented fertility change in post-socialist and post-Soviet Europe, there is not a comparable literature on fertility change in post-Soviet Central Asia. The available evidence, however, suggests that fertility trends in post-Soviet Central Asia show certain parallels with those in post-Soviet Europe. First, there are indications of substantial declines in period fertility. Vital registration data collated by UNICEF (TransMONEE 2006) suggest larger absolute declines than in post-Soviet Europe, and comparable relative declines: between 1989 and 2003, total fertility fell from 4.3 to 2.6 in Turkmenistan, from 3.8 to 2.5 in Kyrgyzstan, and from 2.8 to 2.0 in Kazakhstan; between 1990 and 2003, from 4.1 to 2.4 in Uzbekistan; and between 1989 and 2000, from 5.1 to 3.7 in Tajikistan. Second, there are indications that, as in post-Soviet Europe, fertility reached a peak in 1987 and then declined thereafter (Becker and Hemley 1998; Agadjanian 1999). Third, in the first half of the 1990s fertility decline specifically involved the reduction of higher-order births. Thus, Agadjanian and Makarova (2003, p. 471) argue that post-independence economic hardship in Uzbekistan in the early 1990s acted to discourage births 'beyond the minimally acceptable one child'. Similarly, Agadjanian et al. (2008) show that first birth rates in Kazakhstan were relatively stable, in comparison to rates at higher orders, until the mid-1990s, consistent with an increase in the share of first births in total fertility during this period (Becker and Hemley 1998). From the mid-1990s, however, there is evidence for a decrease in the rate of first births within marriage in Kazakhstan (Agadjanian et al. 2008), and a decrease in the first marriage rate in Kazakhstan and Uzbekistan (Dommaraju and Agadjanian 2008). However, no information is available on order-specific change in post-Soviet Tajikistan. Changes in nuptiality in Tajikistan, and their contribution to fertility change, have also not been addressed. Therefore, the first research objective is to contribute to our understanding of post-socialist demographic change by describing trends in fertility and nuptiality in post-Soviet Tajikistan.

1.2 Fertility During Food Crises and Civil War

There is strong evidence that food crises reduce fertility in the short-term. Galloway (1988), examining the response of vital rates to annual fluctuations in grain prices in nine pre-industrial European countries, finds a decrease in fertility most evident 1 year after the price shock, and a fertility rebound in the second year. There was also a very close correspondence between the rise in food prices and a decline in conceptions during the South Asian famines of the nineteenth and twentieth centuries (Dyson 1991a, b). Similarly, Lindstrom and Berhanu (1999) find evidence

for a decrease in conception probabilities during years of drought and famine in Ethiopia in the 1970s and 1980s, often followed by a rebound in the following year.

Direct evidence to assess the relative importance of biological factors (such as an increase in amenorrhoea and spontaneous abortion because of malnutrition) and behavioural factors (such as a decrease in marriage rates, an increase in migration and spousal separation, or an increase in conscious fertility control) is often lacking in studies of this kind. While Bongaarts (1980) and Menken et al. (1981) conclude that chronic malnutrition has only a minor biological effect on fertility levels, acute malnutrition may have a significant impact on fecundity (Stein and Susser 1975) and foetal mortality (Pebley et al. 1985). The psychological stress of a crisis can induce amenorrhea (Cai and Feng 2005) or reduce libido (Hionidou 2002). However, Bengtsson and Dribe (2006), for a pre-transitional population in Sweden, argue that the strong fertility response in the first 6 months after a grain price shock points to the importance of deliberate fertility control, and the ability to anticipate years of economic difficulty. Dyson (1991a) finds evidence for a similar almost 'anticipatory' fertility response which, in contrast with the more delayed mortality effects, tends to favour behavioural explanations over biological ones. Thus, Lindstrom and Berhanu (1999) attribute declines in marital fertility to a combination of the unintentional influence of increases in spousal separation through temporary migration and the intentional decision temporarily to postpone births in crisis periods. Since we know that nuptiality tends to decrease during years of grain price shocks (Galloway 1988), decreases in the marriage rate can also be an important contributor to decreases in overall fertility levels.

These behavioural factors are also likely to play an important role during periods of military conflict. Lindstrom and Berhanu (1999) study showed that, as well as fluctuating during periods of famine, conception probabilities decreased during peak years of military unrest. Agadjanian and Prata (2002) similarly find evidence for a drop in fertility during wartime in Angola, followed by a subsequent post-war rebound. On the other hand, Khlat et al. (1997) find no evidence for a significant decline in fertility in Beirut, Lebanon, during the civil war. Differing responses to war reflect Sillanpää's (2002) argument that the demographic impact varies according to the length and severity of the conflict, together with the ability of the population to adapt and the extent of spousal separation.

2 Post-Soviet Tajikistan: Social and Economic Changes, and Periods of Crisis

Tajikistan has experienced acute social and economic problems since independence. The extent of the crisis is difficult to overstate. Tajikistan had been dependent on subsidies from Moscow during the Soviet era—making up 47% of total government revenues, the highest proportion in the USSR; it also had the highest inter-republic trade deficit (Foroughi 2002). The withdrawal of subsidies and the disruption of trading relationships, together with the transition to a free-market economy, led to dramatic economic declines (Falkingham 2005). By 1996, GDP was just 39% of 1989 levels (TransMONEE 2006), the biggest decline in Central Asia, while it's GDP per capita of $1,041 (purchasing power parity) in 1998 made it one of the

poorest countries in the world (United Nations Development Programme 2000). Annual average inflation was 4% in 1990, then increased to 112% in 1991, the year of independence, before soaring to 1,157% in 1992 and 2,195% in 1993 (Economist Intelligence Unit 1997). It did not decline to double figures until 1997. Real wages in 1994 were estimated to be 6% of 1989 levels, which represents the most dramatic decline in any post-socialist or post-Soviet country (TransMONEE 2006). Unemployment increased (Falkingham 2000) while the system of social welfare collapsed (United Nations Development Programme 2000; De Soto et al. 2001). Vast swathes of the population were plunged into poverty. By the end of the millennium, 95% of the population were classed as living below the official minimum subsistence level (Falkingham 2003). The ability of the population to adapt through subsistence agriculture has been hampered not only by the difficult mountainous terrain, but also by the inherited Soviet system of collectivised land geared towards the production of cotton (see Duncan 2000). In sum, Tajikistan—which was the poorest of the Soviet republics, with average income in 1988 around 50% of that in the Russian Federation (Atkinson and Micklewright 1992, p. 134)—has also experienced the most severe social and economic problems since independence, with a population among the least able to adapt to the changes thrust upon it.

In addition, over and above dramatic economic decline and social change, Tajikistan's population has been subject to three specific shocks: a protracted civil war, lasting until 1997 but with peak fighting in the latter half of 1992; a food crisis in 1995, and a drought in 2000–2001, which also led to food shortages. Therefore, the second research objective of the article is to assess whether there is evidence to suggest that these periods of crisis had a negative effect on marriage and fertility levels.

2.1 Civil War

Figures for the number of casualties in the civil war, between supporters of the Communist party government and a coalition of groups in 'opposition', are hard to establish; the International Crisis Group (2001) estimate that 60,000–100,000 people were killed between 1992 and 1997, from a total population of 5.1 million (at the time of the 1989 census). Many more were displaced by the conflict: 500,000–600,000 people were internally displaced, mainly people in and around Kurgan-Tyube fleeing to the capital Dushanbe (and some to Gorno-Badakhshan Autonomous Oblast); an estimated 70,000–100,000 fled to Afghanistan (Foroughi 2002; Lynch 2002), the majority of whom had returned to their permanent place of residence by the end of 1993. The most severe fighting took place in the last 6 months of 1992 in Kurgan-Tyube and Kulyab (both in what is now the region of Khatlon) (Brown 1998), though the capital Dushanbe and the Region of Republican Subordination (RRS) were also affected. By the beginning of 1993, the outcome of the civil war had been effectively decided after Communist forces took control of Dushanbe (Atkin 1997).

2.2 Food Crisis in 1995

By the mid-1990s, the economic crisis had already affected household food consumption. Expenditures on bakery products and vegetables were more stable than those on protein (Falkingham et al. 1997; Babu and Reidhead 2000), reflective of a change in diet composition which Howell (1996) interprets as a 'reductive' response to the economic crisis. The population became more dependent on the traditional staple of bread, the cheapest source of calories.

Throughout the Soviet era, Tajikistan was dependent on the import of grain from other republics; in the early post-Soviet years, with food security no longer the responsibility of Soviet central planning, trading links and payment mechanisms took time to be fully established. Stocks of grain were drawn down to very low levels, while the government's ability to fund imports was restricted by debt, a lack of currency revenues and a fall in production of cotton and aluminium, the main barter commodities (World Food Programme 1996). Imports in 1994–1995, nearly half of which were aid, were just half of the 1993–1994 level, leading to sharp declines in total cereal availability (Table 1). Shortages of flour and basic foodstuffs, leading to social unrest in Dushanbe and other major cities, were reported in late 1994 (Economist Intelligence Unit 1994).

The acute shortage of grain at this time prompted dramatic increases in bread prices. During the Soviet period, subsidised food prices had helped to maintain food security. Following independence, the first government of Tajikistan lifted controls on 80% of goods in January 1992 (Kaser 1997), but bread prices continued to be partly state-controlled. However, rationed state bread only provided for a fraction of people's needs. The price of open market bread, meanwhile, increased sixfold in the first 6 months of 1995 (Grand et al. 2001). In May 1995, at the same time as a new currency was introduced, the government announced a 150% increase in the price of state bread and flour products; in August, it announced the complete lifting of these price controls (Economist Intelligence Unit 1995b, p. 40). The impact of these price rises was accentuated by a severe shortage of cash in the republic. Many state

Table 1 Average cereal availability and utilisation in Tajikistan 1990-95 (thousand tons)

	1990–1992 (average)	1993/1994	1994/1995
Total availability	1720	1135	674
Opening stocks	350	80	26
Production	270	255	239
Imports	1100	800	409
Utilisation	1720	1135	674
Food use	870	660	498
Feed use	400	309	60
Other uses	200	140	110
Closing stocks	250	26	6
(Per capita consumption, kg/pa)	(160)	(120)	(90)

Source: FAO Global Information and Early Warning System, in World Food Programme (1996)

employees had not been paid since January 1994, while others had only been paid in kind (Economist Intelligence Unit 1995a). Meanwhile, the devaluation of the new national currency from May 1995 contributed to the bankruptcy of most of the collective (*kolkhoz*) and state (*sovkhoz*) farms, which were the main source of livelihood for rural households. Until 1995, the *kolkhoz* had still been able to pay their workers a small salary, despite the decrease in production and the disruption caused by the civil war (Grand et al. 2001).

The food crisis was widespread and acute. The preceding years of economic crisis had left the population even more reliant on bread and therefore vulnerable to changes in its availability and price. The scarcity of flour, rationing of bread and increase in prices in 1995 was therefore a major problem: 'families found themselves compelled to sell their last livestock and any other valuables they still possessed in order to purchase a few sacks of flour to feed their families for a couple of months' (Harris 1998, p. 665). Harris (2004, p. 29) argues that 'many people suffered significant hunger over a period of many months', and that it was only the aid from international relief agencies that prevented famine.[2]

The shortage of grain persisted into early 1996, with further significant increases in bread prices (Economist Intelligence Unit 1996). However, the food supply crisis in 1995 prompted the government to increase the production of wheat on *kolkhoz* farms and to allocate 50,000 ha of farmland for household use (Grand et al. 2001). It also prompted households to change their behaviour. Harris (1998, pp. 665–666) notes that, after 1995, villagers decided to devote more of their private household plots to growing wheat, rather than vegetables. The increase in the price of wheat also served to stimulate production. Therefore, domestic grain output rose to a record 548,000 tonnes in 1996, up from 249,000 in 1995 (Economist Intelligence Unit 2001b). Indeed, bread was in general widely available, and prices had stabilised, by mid-1996 (Economist Intelligence Unit 1998).

2.3 Drought in 2000–2001

Food insecurity remained a big issue in the late 1990s. Flour prices remained high in comparison to household income. In rural areas, in the absence of income from the *kolkhoz*, many came to rely heavily on their own wheat production from household plots. More generally, the suite of social and economic shocks in the post-Soviet era had undermined any capacity to cope with further shocks such as a poor harvest.

In 2000 and 2001, Tajikistan suffered a severe drought, estimated to be the worst for 70 years. Annual rainfall was below the long-term average across the country. Most significantly, rainfall in March and April in both years—the key months for the wheat crop cycle—were low, averaging less than half of the long-term average (FAO/WFP 2001). Overall, wheat production dramatically declined from 475,000

[2] There is historical precedent for the 1995 food crisis in Tajikistan. As Harris describes (Harris 2006, p. 26), in the early part of the twentieth century, just as in the Soviet period, the population in what is now Tajikistan was reliant on grain imports after the Tsarist government persuaded local farmers to plant cotton rather than grain. Just as in 1995, these imports were then disrupted—in this case during WW1 when the train lines were cut, stopping grain arriving from the north. In the absence of any international aid, there was a serious famine, estimated to have killed almost a million people (Etherton 1925, p. 154).

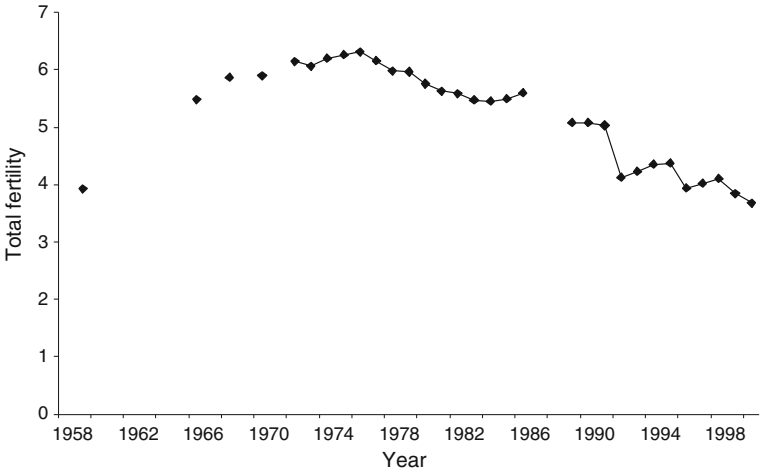

Fig. 1 Total fertility in Tajikistan based on vital registration data, 1959–2000. *Note*: Rates pre-1989: plotted rate in 1975 refers to 1974–1975; 1976 refers to 1975–1976, etc. No data found for 1987 and 1988. *Sources*: Jones and Grupp (1987) for 1959–1974; Vestnik Statistiki (Goskomstat multiple years) for 1975–1986; TransMONEE (2006) for 1989–2000

tonnes in 1999 to 255,000 thousand tonnes in 2000 (Economist Intelligence Unit 2001b, p. 40) and 300,000 tonnes in 2001 (World Food Programme 2003). This had a serious effect on food security. There was a 63.6% increase in price of foodstuffs in 2000 (Economist Intelligence Unit 2001b). Especially vulnerable were those in rural areas whose household crop had failed. The situation was particularly acute in the second year of drought in 2001, as people had exhausted whatever coping strategies remained.[3] As many as one million people faced malnutrition and potential starvation (Economist Intelligence Unit 2001a) and were dependent on international aid. Following the drought conditions in the 1999/2000 and 2000/2001 cropping season, rain during the 2001/2002 cropping season was in line with the long-term average, and production in 2002 recovered to 1999 levels.

3 Tajikistan's Fertility in Historical Perspective

Traditionally in Tajikistan, as elsewhere in Central Asia, demand for children has been high (Tabyshalieva 1997). But in pre-Soviet times, and into the Soviet era until after World War II, realised family size was limited by high levels of infant and child mortality associated with epidemics of measles and other diseases (Harris 2004). It was not until the 1960s that living standards and medical facilities were sufficient to reduce mortality and effect rapid population growth (Harris 2002). Fertility rates also increased (Anichkin and Vishnevskii 1994) with vital registration

[3] The head of the International Federation of Red Cross' mission in 2001 reported that 'people have already sold parts of their homes including doors and windows. They now have nothing left to sell… We have seen children digging among rat holes in wheat fields, searching for grain hoarded by the rodents for the winter' (IRINCAS 2001).

data showing increases of 50% by the mid-1970s (Lutz and Scherbov 1994) (Fig. 1). This probably reflects a real increase in fertility—owing to a reduction in breastfeeding, improvements in nutrition and a reduction in the spousal age difference—but also increasingly complete birth reporting as the Soviet registration system developed (Jones and Grupp 1987).

Patriarchal and patrilocal social relations have been important in underpinning a high demand for children. Further, in rural areas, children provide a much needed source of labour. Soviet era influences have also played an important role: as Harris (2002, p. 218) summarises, 'benefits paid to mothers of large families, cheap housing, free education and health care, free plots of land for members of communal and state farms, and the low costs of essential food stuffs all made it possible for most families to afford the economic costs of many children without too much hardship'. In many ways, the system represented an artificial 'greenhouse' environment, in which state population policy was important in shaping family decisions and, even amongst the urban population, reproduction was not impacted by career choices (Sobotka 2002).

It was not until the mid-1970s that family planning programmes began to be introduced following concern about high population growth rates in the region. In Tajikistan, the intrauterine device (IUD) was introduced around 1980—but while demand was high among women, they often met resistance from their husbands or mothers-in-law and, in any case, supplies were limited (Harris 2002). Nevertheless, according to vital registration data, fertility peaked in 1976 at 6.3 children per woman and had declined to 5.45 by 1984. Pre-independence declines in fertility were largely restricted to those aged 35 years and over and probably largely reflected trends in the urban population, where access to modern contraceptives was easier (Harris 2002, p. 219). Thereafter, as elsewhere in the Soviet Union, fertility increased slightly following the introduction of family policy measures (United Nations Economic Commission for Europe 2000, p. 182), reaching a peak in 1987. Fertility subsequently started to decline, mirroring wider Soviet trends, and had reached a figure of 5.04 by the time of independence in 1991 (TransMONEE 2006). Despite this decline, by the end of the Soviet era, Tajikistan was still regarded as 'pre-transitional' (Anichkin and Vishnevskii 1992, p. 61). Central Asia had the highest fertility rates in the Soviet Union, with Tajikistan showing the highest rates of all (Turner 1993) and the ideology of large families 'well established' among the local population (Harris 2002, p. 219).

4 Data and Method

Under-registration of births has traditionally been a problem in Central Asian vital registration figures (Anderson and Silver 1989), and the quality of registration data has declined further since independence. However, some attempt to correct for under-registration is made. Indeed, many children who are unregistered at the time of birth are registered at a later date, often at the age of seven when children start attending school, since non-registered children cannot be enrolled. Annual estimates of fertility are corrected to reflect these late registrations; at the end of 2007, the

estimate for 2000 was in the process of being corrected. The vital registration figures are much improved by this adjustment, but should still be used with an element of caution.

Therefore, this article also makes use of other data sources to examine trends in fertility. Census data is used to calculate a child–woman ratio. The census took place in January 2000, time *t*. The child–woman ratio in 1999 is calculated as the number of children aged 0 years at *t* per 1,000 women aged 15–49 years at *t*. In the same way, the child–woman ratio for 1998 is the number of children aged 1 year at *t* per 1,000 women aged 16–50 years at *t*. Whipple's index provided no evidence for strong age heaping in the census data. The ratio calculated here is conditional on survival of the children, as well as the women, until the time of the census so does not control for any changes in infant mortality across the period.

In preference to vital registration data and to complement trends calculated using census data, birth and marriage histories from two nationally representative sample surveys are used to reconstruct marital and fertility trends since independence: the 2003 Tajikistan Living Standards Survey (TLSS), and the 2005 Multiple Indicator Cluster Surveys (MICS). Both the surveys included a female questionnaire, for women aged 15–49 at the time of the survey, with a section on the fertility history of respondents. The numbers of women interviewed were 6,196 and 10,626, respectively. Unlike the MICS, where only the dates of a woman's first and most recent births were recorded, the TLSS contains a complete birth history—making it most suitable for analysing trends in total fertility and higher-order births. Meanwhile, unlike the TLSS, the MICS recorded the month and the year of a woman's first marriage, making it the most suitable for analysing changes in nuptiality and first births within marriage.[4] To ensure comparability across time for periods before the survey, rates are calculated based on the births and exposure of women aged 15–34 years, for periods where the age distribution of women is complete up to age 35 years (1989 onwards).[5] This is likely to yield a conservative estimate of fertility decline, since it excludes any reductions in fertility among women aged 35 and over.

The starting point in the survey analysis is the calculation of annual total fertility estimates for 15–34 year olds (hereafter $TF_{15–34}$) using the TLSS. Following Handwerker (1988) and Ren (2004), standard errors for each of the annual estimates of total fertility, and the covariance between adjacent estimates, are calculated using Tukey's jackknife, with replicates based on the survey primary sampling units. In

[4] Many religious wedding ceremonies (*nikoh*) in Tajikistan are not officially registered (Dikaev 2005). Therefore, in the MICS survey, women were asked the question 'In what month and year did you first marry or start living with a man as if married?' This is a more accurate reflection of the date of union than the date of marriage registration and, given the significant under-registration issues, a more complete one. Throughout this article, the terms 'rate of first marriage' and 'rate of first union formation' are used interchangeably; both refer to measures calculated on answers to this question.

[5] Truncation is less of an issue for trends in first unions and first births, which are concentrated at a relatively young age in Tajikistan: traditionally an unmarried woman over the age of 20 is in danger of being considered an 'old maid' (Tabyshalieva 1997, p. 52). Therefore, these rates are calculated based on events and exposure for women aged 15–29 years inclusive, for 1986 onwards.

turn, these are used to calculate confidence intervals for the difference in total fertility between two adjacent years of interest.

Interest also lies in unpacking changes in overall fertility into the component trends in first unions, first births within unions, and higher-order births. Rates of first union formation (hereafter, 'rates of first marriage'), specific to those women who have never been in union (hereafter, 'unmarried' women), are calculated using a simple piecewise-constant hazard model (Model 1):

$$\lambda_{ij} = \lambda_j \exp\{\mathbf{x}'_i \beta\} \quad (1)$$

In this model, λ_{ij} is the hazard corresponding to woman i in age group j, λ_j is the baseline hazard for age group j, and $\exp\{\mathbf{x}'_i \beta\}$is the relative risk, a proportionate increase or decrease in the rate associated with the covariate characteristics $\boldsymbol{x}_{i\cdot}$.[6] The chosen age groups broadly reflect 'early' (15–17), 'peak' (18–20) and 'late' (21–29) ages at first union.[7] Since interest lies in describing overall trends in union formation, dummy variables for calendar year are the only other covariates included. A similar model, with the same baseline categories, was used to describe trends in the overall rate of first births to childless women (Model 2). To more specifically examine the rate of progression to first birth[8] following first union, a model was specified with process time t representing time since first union and the baseline hazard divided into periods since union (0–9 months; 10–15; 16–30; more than 31 months)[9] (Model 3). Corresponding models, with process time t representing time since the previous birth (0–12 months, 13–24, 25–36, 37–48, more than 60) were used to examine trends in higher-order births[10] (collectively termed 'Model 4'). Finally, higher-order births were pooled together in one survival model to increase the power of tests for differences in fertility between annual periods[11] (Model 5). Table 2 summarises the models used in the article.

[6] See Rodríguez (2007) for a helpful introduction to proportional hazard models.

[7] The baseline hazards of all models were chosen with two considerations in mind: first, to adequately control for compositional changes in the population at risk over time; second, to ensure a parsimonious model with reasonably few parameters. The baseline hazards in the paper reflect a balance between these two criteria, such that further increasing the number of categories for the baseline hazard does not alter the period coefficients.

[8] In the models here, modelling the hazard of a birth at a given process time t is preferred to shifting back the date of birth by 9 months and modelling the hazard of conception. Focusing only on conceptions does not account for any period effects on fertility acting, for example, through changes in the rate of spontaneous abortions. Ideally, one would use a series of models to estimate separately period effects on conceptions within union, and on spontaneous abortion after conception, but these data are not available.

[9] In the MICS survey, the month but not the date of first union was recorded. In calculating exposure time between date of first union and date of first birth, unions were assumed to take place on the 15th of the month. In total, 332 first births (8% of the total of 4,245 between 1986 and 2004 in the sample) were excluded: 15 first births to women who had never been in first union, and 317 births with an estimated conception date before marriage.

[10] Since there are very few higher-order births to women outside of union in Tajikistan (an estimated 3.5% of second births in the TLSS survey, and less than 1% of births at orders three or above), we present models for overall parity-specific rates and do not consider separate models specifically for those in union.

[11] A covariate for the woman's highest educational level was also included but, since made it no difference to the nature of the temporal trend, was not retained.

Table 2 Summary of models used

No.		Ages	Exposure starts	Exposure ends[a]	Data	Figure
1	Rate of first union	15–29	15th birthday	Date of first union	MICS	7
2	Rate of first birth	15–29	15th birthday	Date of first birth	MICS	6
3	Rate of first birth within union	15–29	Date of first union	Date of first birth	MICS	5, 8
4	Parity specific rate, order j (where $j \geq 2$)	15–34	Date of birth of order i	Date of birth of order j	TLSS	5
5	Rate of higher order birth	15–34	Sum of exposures of parity-specific rates, orders 2–13		TLSS	8

[a] Unless censored by survey date, or by reaching upper age

5 Results

In line with the article's first objective, to understand the nature of post-socialist demographic change, this section begins by describing trends in fertility in Tajikistan across the late- and post-Soviet years. Here, the focus is first on establishing the nature of the overall trend—by comparing estimates from vital registration, census and survey data—and then on decomposing it into constituent trends in higher- and first-order total fertility, parity-specific rates, and nuptiality using survey data. Then, relating to the second objective, the focus turns more specifically to the year-on-year changes in these trends during periods of civil war and food crisis.

5.1 Overall Trends

Figure 2 presents variations in fertility levels in Tajikistan since 1989 according to three different sources: vital registration ($TF_{15–49}$),[12] TLSS survey ($TF_{15–34}$) and census (child–woman ratio$_{15–49}$). Trends revealed by each of the sources—especially the census and survey data—show considerable agreement. The survey and census data suggest that fertility had been declining in the years immediately before independence. All three sources also show a decline in fertility since independence in 1991. The $TF_{15–49}$ in 2002, according to the TLSS estimate, is 3.96 (95% CI 3.72–4.20). The trend in the $TF_{15–34}$, reconstructed using the TLSS for the 1989–2002 period, provides clear evidence for fertility decline: the estimate of 2.58 (95% CI 2.35–2.83) for 2002 compares to 3.57 (95% CI 3.20–3.90) in 1989. Therefore, the decrease in fertility evident in vital registration figures is not simply an artefact of an increase in under-registration of births.

Importantly, declines in total fertility in the late Soviet and early post-independence years reflect declines in higher-order fertility (Fig. 3, 4). The parity-specific rate of second-, third- and fourth-order births in 1993 was, respectively, 82, 76

[12] No official registration data on age-specific fertility rates for Tajikistan are available after 1995 from TransMONEE (2006), precluding calculation of the $TF_{15–34}$ for direct comparison with the survey estimate.

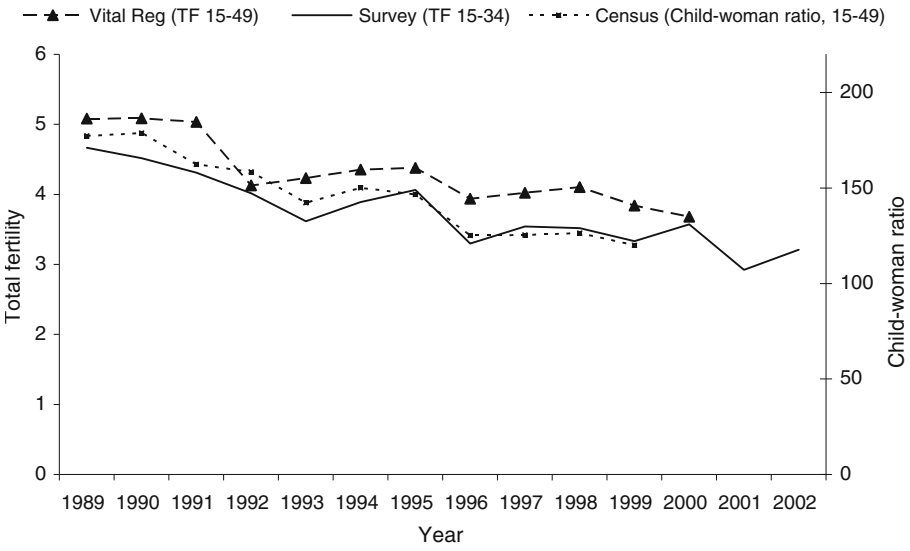

Fig. 2 Fertility trends in Tajikistan, 1989–2002, based on three different sources. *Note*: for explanation of child–woman ratio, see Sect. 4. *Sources*: vital registration: TransMONEE (2006); survey: analysis of TLSS (2003) data; census: calculations using data published in Tajikistan State Committee on Statistics (2001)

and 72% that of the rate in 1990 (Fig. 5).[13] In contrast, since the mid-1990s higher-order fertility has been relatively robust and total fertility decline has been effected through a decrease in first-order fertility (Figs. 3, 6). In turn, since—outside of particular crisis periods—the rate of first births to childless women within marriage has remained relatively stable (Fig. 5), and since conceptions outside of marriage are rare,[14] this has been driven by a decrease in the rate of first union formation (Fig. 7). This decrease in the rate of first union formation has been dramatic: the rate in 2002 was just 46% of 1989 levels (and 34% the rate in 1993) and has been the most significant driver of fertility change in Tajikistan in recent years. The rate of first birth to childless women in Tajikistan in 2003 was 54% of the rate in 1989 (and 36% the rate in 1994).

While the higher-order decline in the early 1990s and the first-order decline from the mid-1990s are of particular interest, the periods of lack of decline are also significant. First, there is evidence that first-order fertility actually rose during the difficult late-Soviet and early post-independence years (Fig. 6), reflecting both an increase in the rate of first union formation—such that the rate in 1993 was 35% higher than in 1989 (Fig. 7)—and a continued high rate of progression from first union to first birth (Fig. 5). Second, the rate of birth at higher orders has remained stable since the mid-1990s, with no further decreases in second, third or fourth

[13] Since annual parity-specific rates are subject to sampling variability at higher-birth orders, the rates are smoothed using a 3-year moving average.

[14] 332 first births (8% of the total in the sample) were estimated to have been conceived before marriage (see footnote 9).

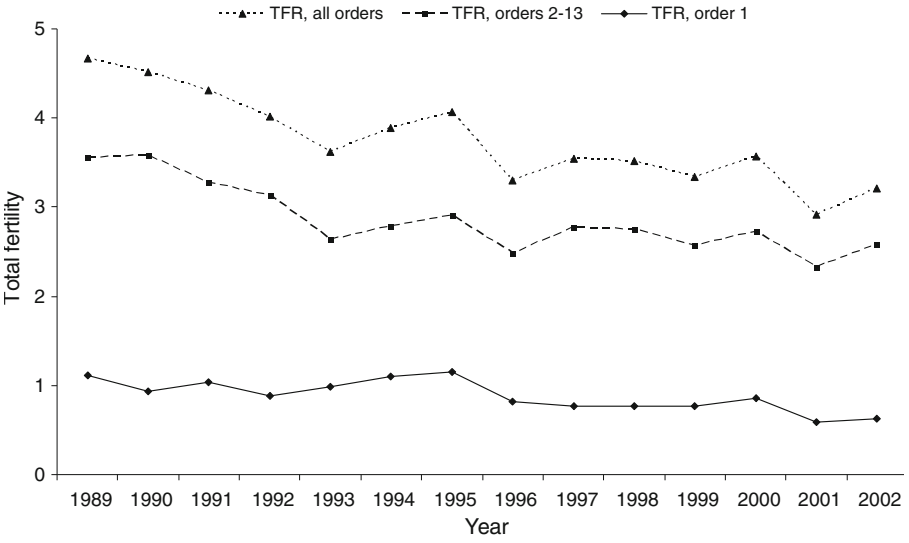

Fig. 3 Total fertility ($TF_{15–34}$) trends by birth order in Tajikistan, 1989–2002. *Source*: analysis of TLSS (2003)

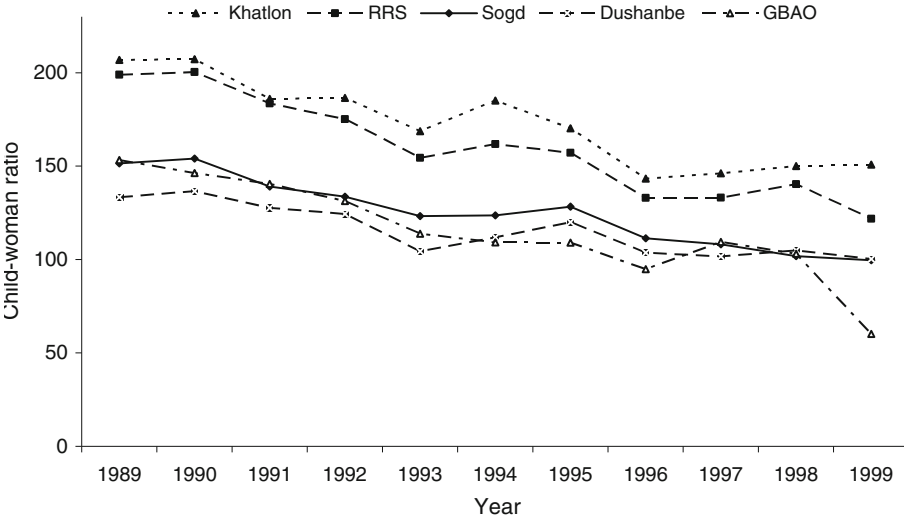

Fig. 4 Regional fertility trends in Tajikistan, 1989–1999: estimates using the 2000 census. *Note*: for explanation of child–woman ratio, see Sect. 4. *Source*: calculations using data published in Tajikistan State Committee on Statistics (2001)

parity-specific rates (Fig. 5), or for higher orders as a whole (Fig. 8). It should be acknowledged that, since the analysis is restricted to women aged 34 and under, there could have been a significant reduction in fertility at higher ages which has

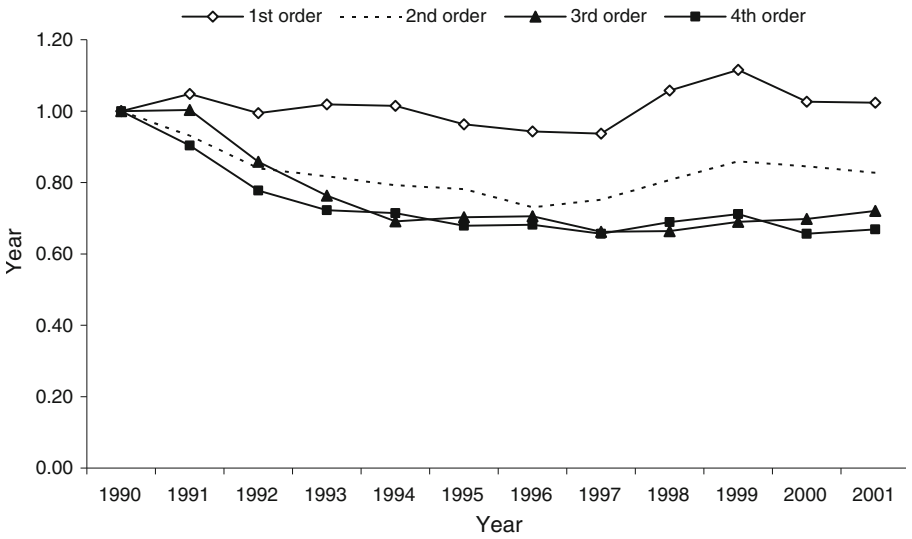

Fig. 5 Smoothed trends in parity-specific fertility rates, 1990–2001 (3 year moving average). *Notes*: 1st order: exposure is time since union; for women aged 15–29 inclusive; results of piecewise-constant hazard model (Model 3). 2nd, 3rd, 4th orders: exposure is time since previous birth; for women aged 15–34 inclusive; results of piecewise-constant hazard model (Model 4). *Sources*: 1st order—analysis of MICS (2005); 2nd, 3rd, 4th orders—analysis of TLSS (2003)

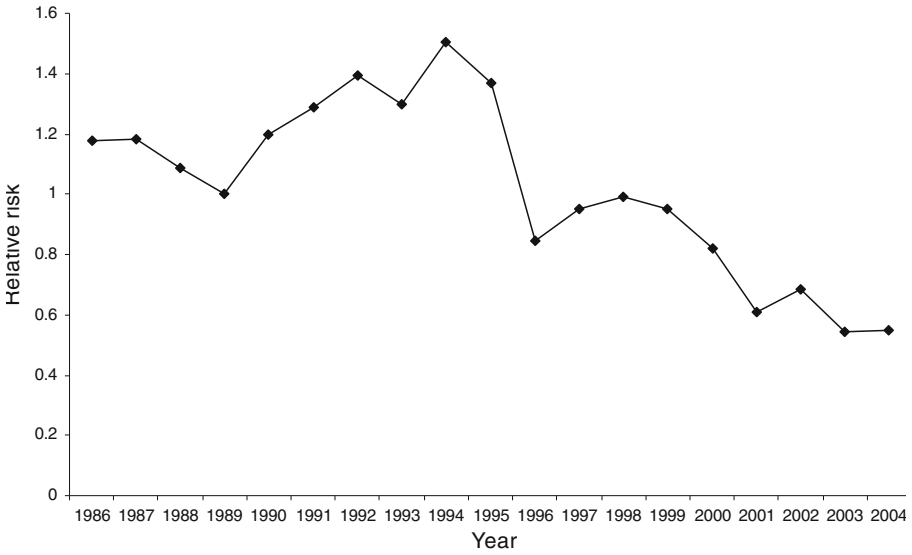

Fig. 6 Relative risks of a first birth, 1986–2004 (reference year: 1989). *Notes*: for women aged 15–29 inclusive; results of piecewise-constant hazard model (Model 2). *Source*: analysis of MICS (2005)

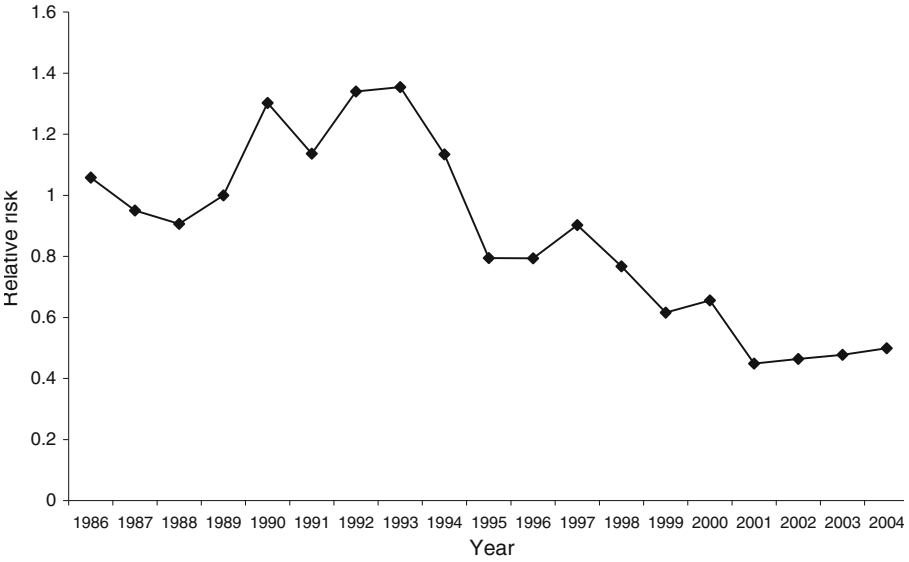

Fig. 7 Relative risks of a first union, 1986–2004 [reference year: 1989]. *Notes*: for women aged 15–29 inclusive; results of piecewise-constant hazard model (Model 1). *Source*: analysis of MICS (2005)

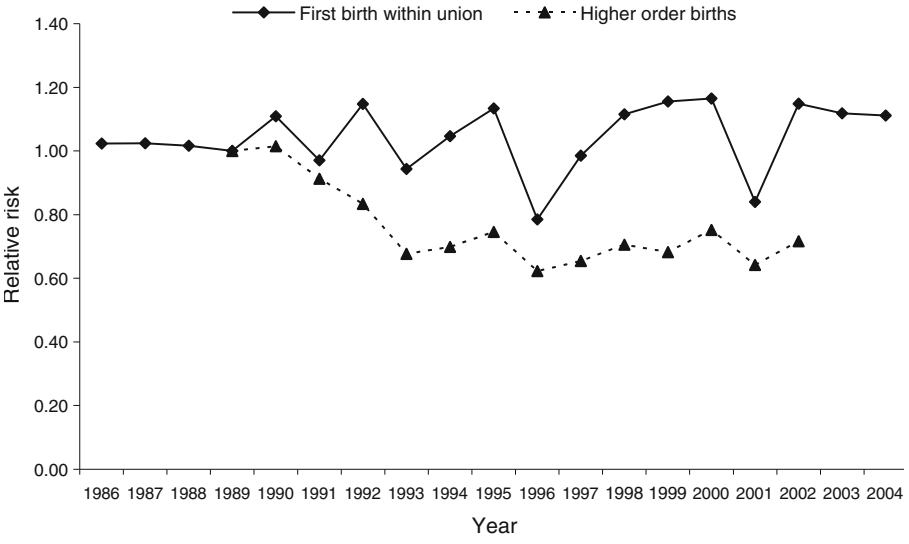

Fig. 8 Relative risks of a first birth within union, 1986–2004, and of a higher order birth, 1989–2002 [reference year: 1989]. *Notes*: first birth: for women aged 15–29 inclusive; results of piecewise-constant hazard model (Model 3). higher order birth: for women aged 15–34 inclusive; results of piecewise-constant hazard model (Model 5). *Sources*: first birth—analysis of MICS (2005); higher order birth—analysis of TLSS (2003)

remained undetected. Nevertheless, for the ages considered, it is clear that the decline in higher-order births to in the late 1980s and the early 1990s has not been sustained.

5.2 Civil War, Food Crisis and Drought

While survey, vital registration and census data all show a decline in total fertility over the post-Soviet years, all three sources also indicate that the post-Soviet trend has been far from a consistent, year-on-year decline (Fig. 2). Indeed, fertility levels have fluctuated, to an extent which is unusual in comparison to the Soviet era (Fig. 1), pointing to the importance of particular crisis periods.

Vital registration data show a very sharp fall in $TF_{15–49}$ from 1991 to 1992, compared to the more gradual decline apparent in survey and census data (Fig. 2). This probably reflects the breakdown in the registration system during the most intense period of fighting in the civil war in the latter half of 1992—a conclusion which is supported by regional registration data (not shown) showing that this decline was particular to Khatlon, RRS and Dushanbe, the three regions most affected by the war. The survey and census data show a decline in fertility from 1992 to 1993, but at a similar rate to the decline in preceding years, suggesting that the intense fighting had little immediate impact on aggregate fertility levels. While the rate of a higher-order birth was significantly lower in 1993 than in the preceding year[15] (relative risk 0.81; 95% CI 0.69–0.95; $p = 0.011$[16]), this is not especially distinctive in the context of previous year-on-year declines (Fig. 3). Interestingly, there is no evidence that marriage levels declined during the peak military conflict; on the contrary, marriage rates were higher in 1992 than in the late Soviet period (Fig. 7).

There is a sharp decrease in fertility between 1995 and 1996 (Fig. 2). The survey estimate for the annual difference in $TF_{15–34}$ is 0.77; 95% CI 0.38–1.15; $p < 0.001$). Census and vital registration data show a similar extent of decline, which is distinctive in scale from the annual declines evident in Soviet-era trends (Fig. 1). From 1994 to 1995 there were sharp declines in first marriages to unmarried women (relative risk 0.70; 95% CI 0.56–0.88; $p = 0.003$) (Fig. 7). Given the very strong link between first marriage and first birth in Tajikistan,[17] this was the major contributor to the fertility decline in 1996.

However, as Fig. 8 shows, there were also declines in the rate of births within marriage. There is strong evidence for a decline in first births to childless women within marriage from 1995 to 1996 (relative risk 0.69; 95% CI 0.55–0.87; $p = 0.001$). Together with the decline in the rate of first marriage, this had a cumulative impact on the decline in the overall rate of first births to childless women from 1995 to 1996 (relative risk 0.62; 95% CI 0.49–0.78; $p < 0.001$) (Fig. 6). The rate of a higher-order birth also fell significantly from 1995 to 1996 (relative risk 0.83; 95% CI 0.73–0.96; $p = 0.009$) (Fig. 8). Overall, there is a suite of converging evidence—including distinctive decreases in overall fertility apparent

[15] Higher-order births are pooled together in this model to increase the power of tests for differences in fertility between annual periods.

[16] This, and subsequent, p values from model estimates are results of Wald tests assessing the significance of a calendar year coefficient at the 5% level, compared with a reference comparison year. Standard errors were adjusted to take account of the surveys' sample design.

[17] Across all the women in the survey to have had a first birth within marriage, almost 40% (65%) had their child within the first year (18 months) of marriage.

in vital registration, census and TLSS survey data, and distinctive decreases in the rate of first birth from MICS data—which is consistent with a reduction in fertility because of the 1995 food crisis. As we might expect, since the population as a whole had been reliant on imports for its grain supply (including in rural areas, where cotton dominated agricultural production), census data suggest that the demographic effect of the grain shortage in 1995 was spatially pervasive (Fig. 4).

Since the vital registration figures for 2000 onwards are yet to be adjusted for under-registration, and the census took place in 2000, only survey data are available to investigate the most recent fertility trends (Fig. 2). The TLSS survey data indicate a significant decline in total fertility from 2000 to 2001 (survey difference in $TF_{15–34}$ 0.65; 95% CI 0.27–1.03; $p < 0.001$), but this should be interpreted with an element of caution until corroborated by other data. Interestingly, there is no evidence for a decline in the rate of marriage, or in the rate of childbearing within marriage, during the first year of the drought. During the second year, however, when the population experienced the cumulative impact of two consecutive poor harvests, there are significant declines. From 2000 to 2001, there is a decline in the rate of marriage (relative risk 0.68; 95% CI 0.53–0.88; $p = 0.003$) (Fig. 7), the rate of first births within marriage (relative risk 0.72; 95% CI 0.58–0.90; $p = 0.004$) (Fig. 8), the overall rate of first births (relative risk 0.74; 95% CI 0.60–0.93; $p = 0.008$) (Fig. 6) and the rate of a higher-order birth (relative risk 0.85; 95% CI 0.73–0.99; $p = 0.034$) (Fig. 8).

6 Discussion

6.1 Overall Trends

The first objective of the article is to contribute to our understanding of post-socialist demographic change in the Central Asian context. In a number of ways, the results are consistent with the existing evidence detailed in Sect. 1.1 for other ex-Soviet republics in Eastern Europe and Central Asia. First, there is indeed evidence of a substantial decline in period fertility. Second, the census and survey data show that fertility was already declining in Tajikistan before independence in 1991, consistent with 1987 being a peak fertility year across the Soviet Union (Becker and Hemley 1998; Agadjanian 1999). This decline in the late 1980s and the early 1990s may be regarded as a resumption, following half a decade of slight fertility increase associated with pronatalist legislation, of the longer-term decline in fertility (Agadjanian 1999) (see also Fig. 1). Third, in terms of the pattern of change, just as in Kazakhstan (Agadjanian et al. 2008), Uzbekistan (Agadjanian and Makarova 2003) and ex-Soviet Europe (for example, Perelli-Harris 2005), fertility decline in Tajikistan in the early 1990s was driven by reductions at higher orders while first order rates were stable. This article also has some new insights. Perhaps most significantly, it shows that changes in union formation were fundamental to the decline in fertility in Tajikistan from the mid-1990s. It illustrates the dramatic scale of decline of first union formation, and the implications for the rate of first births to childless women (Fig. 6). It also shows that the traditionally swift progression from

marriage to childbearing, noted by Tabyshalieva (1997), has remained swift, reflected in continued high rates of first birth within union.

There are a number of areas which require further research—including the reasons for the increase in the rate of first union formation in the late Soviet and early post-independence years, and the corresponding increase in the rate of first birth. Future work should also probe the reasons for the apparent lack of higher-order decline in fertility from the 1990s, and the extent to which it may reflect unmet need for contraception. It is true that contraceptive use has increased in Tajikistan. Results from the Multiple Indicator Cluster Surveys carried out by UNICEF estimate modern prevalence at 27% in 2000 and 34% in 2005, with the IUD by far the most popular method and contraceptive use confined to women at higher ages and parities (TransMONEE 2006). However, this remains the lowest rate in Central Asia, compared to 42% in Uzbekistan (in 2002), 39% in Kazakhstan (1999), 36% in Kyrgyzstan (1997) and 35% in Turkmenistan (2000) (Westoff 2005). Consistent with the relatively low prevalence of modern methods, the women in villages in which Harris (1999, p. 200) conducted her research 'made it very clear that their major concern was control over their fertility'. In the poorer families, 'both men and women… are desperate to limit their fertility. Although their ideal number of children remains four to six, most young couples know they will not be able to cope with so many without a large improvement in their financial situation and that realistically they should have no more than two' (Harris 2002, pp. 220–221). Thus, Harris' (2002, p. 220) judgement is that fertility would fall further if adequate access to contraceptives could be supplied.

6.2 Civil War, Food Crisis and Drought

The second objective of the article is to contribute to the literature on the demography of conflict and of food crises. Overall, at the national level, there is more evidence for a decrease in birth registration in 1992 than a decrease in fertility in 1993 as a result of the conflict. There is clear evidence in the vital registration data of a sharp decrease in fertility in 1992, but this is a reflection of a decrease in registration rather than a real decrease in fertility as a result of the conflict. To the extent to which the conflict accentuated the fertility decline from 1992 to 1993, this might reflect the impact of spousal separation, but it is difficult to distinguish this decline from the longer-term decline in higher-order births dating from the late 1980s. More generally, detecting the direct longer-term effect on fertility of war-related mortality is compromised by the retrospective nature of the census and survey data, which is conditional on female survival to the date of data collection.

The marriage and fertility responses to the crisis in 1995 and the drought in 2000–2001 in Tajikistan provide further support, following from Galloway (1988), Lindstrom and Berhanu (1999) and Bengtsson and Dribe (2006), to suggest that periods of acute food shortage and high prices can have a significant demographic impact. While it would be helpful to have other data sources to corroborate the changes in 2000–2001, we can be confident that there was a sharp decline in fertility from 1995 to 1996, evident in survey, census and vital registration data and distinctive in scale from typical Soviet-era annual declines. Further, just as

Bengtsson and Dribe (2006) and Dyson (1991a, b) document an immediate, almost 'anticipatory' fertility response to food shortage, so the response is also immediate here. The 1995 crisis developed over the winter of 1994–1995, when imports were only half of the 1993–1994 level (Table 1). Fertility declined significantly in 1996. The swift nature of the response to the crisis points towards the importance of behavioural factors in the fertility decline. Indeed, during the 1995 crisis an acute drop in the marriage rate was the key contributor to the decline in total fertility in 1996—especially so given that in Tajikistan births outside of marriage are rare.

There is also some evidence for a decrease in the rate of first births within union, and a decrease in higher-order births, during the periods of food crisis—particularly from 1995 to 1996. Contraceptive prevalence in Tajikistan is low: in 1991, among sexually active individuals, current use of modern methods was estimated at 3% (Turner 1993). By 1999 this had increased to an estimated 30% (Falkingham 2000), with use confined to women at higher ages and parities. However, prevalence in 1995 was almost certainly lower than this, and contraceptive use at older ages would not explain the decrease in the rate of first births within marriage. If the reduction in births represented the deliberate postponement of childbearing, this must largely reflect the use of traditional methods. Temporary labour migration may also have been a contributor to the decline in the rate of childbearing within marriage. Indeed, Harris (1999, p. 661) points to the mid-1990s as a time in which men in the Gharmi villages of Khatlon decided to become migrant workers in other parts of the Soviet Union, while reports at the time suggest that the drought in Tajikistan in 2000–2001 prompted many men to leave the country to find work (OCHA 2000; World Food Programme 2001). There are, therefore, many possible mechanisms for the decline in first births within union, and in higher-order births, during the food crises, but explanations involving biology (whether through acute malnutrition or psychological stress) and spousal separation seem more reasonable than those focusing on deliberate postponement, given the low prevalence of modern contraception.

However, the changes in nuptiality during crisis are more striking than the changes in fertility within unions: they have a more significant impact on overall fertility levels, and also a more lasting one. There is evidence for a rebound in higher order fertility, and in the rate of first births within marriage, following the 1995 and 2000–2001 crises (Fig. 8). In contrast, there was a longer lasting impact on marriage levels (Fig. 7). Galloway (1988) also notes that the effects of economic crisis on marriage can be prolonged, while Palloni et al. (1996, p. 107) argue that 'when the economic effects of the crisis are long-lasting, a more permanent disequilibrium in the marriage markets sets in, and the making up of postponed marriages ceases to be a feasible option. The consequence is an increase in the proportion of members who never marry'. This describes the Tajik situation well; sustained low marriage rates since the mid-1990s will inevitability translate to an increase in the never-married.

1995, in particular, seems to have been a watershed year, with rates of first union failing to recover significantly subsequently (Fig. 7), and the overall rate of first births remaining well below not only the levels in the early 1990s, but also those seen in the late 1980s (Fig. 6). Indeed, the 1995 case not only involved food shortage but a number of more lasting economic changes. Food shortages eased from mid-1996 but bread, following the end of subsidies, was now much more

expensive than before. Further, the bankruptcy of most of the collective (*kolkhoz*) and state (*sovkhoz*) farms, following the rapid inflation in 1995, led to persistent under- or non-payment of workers in the following years (Grand et al. 2001). These changes, particularly in the Tajik context when the ceremony itself is traditionally very expensive and a focus for conspicuous demonstrations of wealth (Tett 1996), undermined people's ability to finance the costs of a wedding and family formation and may have contributed to the further declines in rates of first union formation in the late 1990s. Large scale labour migration, as well as influencing fertility within marriage, is likely also to be a factor in the prolonged marriage decline from the mid-1990s, given qualitative accounts of a sharp imbalance in the sex ratio (for example, Harris 1998). Indeed, labour migration from Tajikistan has become widespread: Olimova and Bosc (2003), using survey data, estimate that in 26% of Tajik households at least one household member had worked abroad at some point between 2000 and 2003.

7 Conclusions and Future Research

Research on the demographic implications of the dramatic social and economic changes associated with the collapse of communism and the emergence of capitalism has, thus far, tended to focus on Central and Eastern Europe. This article complements and extends existing work by describing the nature of post-socialist fertility and marital change in a very different demographic context. The results presented for Tajikistan in this article show that, despite the very different cultural and demographic context, there are certain parallels between the pattern of fertility change in Tajikistan and post-Soviet republics in Eastern Europe. For example, in the early 1990s, total fertility decline was driven by declines at higher orders, while first-order rates were robust. Most importantly, the article describes the dramatic scale of decline of first union formation since the mid-1990s and illustrates the importance of this decline in driving declines in fertility. The article also contributes to the literature on the demography of conflict and of food crises. Most clearly, it finds evidence from a range of sources for a sharp drop in nuptiality and fertility associated with the 1995 food crisis.

There are a number of future possible research directions. First, while this article has focused on the impacts of particular crisis periods, it does not claim that these were the only factors affecting post-Soviet demographic trends in Tajikistan. Longer-term economic changes associated with the development of a market economy—including the end to generous welfare and family benefits, and reduced job security—are also likely to have been important. The role of ideational and cultural changes could also be considered in future research. Comparing the results presented here for Tajikistan with those in other post-Soviet Central Asian republics would help tease out the relative importance of these changes in driving regional demographic trends. Overall, extending the spatial scope of the work to include other countries in the region, interweaving complementary qualitative insights and also developing our understanding of the social implications of demographic change are further challenging, yet potentially fruitful, avenues for future research.

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